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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/523,374

02/02/2005

Yunsoo Kim

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EXAMINER

TUROC, DAVID P

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

04/30/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/523,374	Applicant(s) KIM ET AL.	
	Examiner DAVID TUROCY	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Korea on 8/2/2002. It is noted, however, that applicant has not filed a certified copy of the KR 10-2002-0045746 application as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3, 5, 6, 7, 10, 11 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent Publication 20010041250 by Werkhoven et al., hereafter Werkhoven.

Werkhoven discloses a method for forming an Al₂O₃ film using ALD including supplying diethylaluminum ethoxide, inert gas purge, water, and inert gas purge (0088-0091). Werkhoven discloses repeating the sequence for the formation of a desired thickness film (0091). Werkhoven discloses silicon substrate (0088), and

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discloses pulsing the precursors for 0.5 seconds (0091). Werhoven discloses temperature of 300°C, which is an explicit endpoint of the range as claimed.

4. Claims 1-8, 10-11 are rejected under 35 U.S.C. 102(e) as being anticipated by “Preparation of Al₂O₃ Thin Films by Atomic Layer Deposition Using Dimethylaluminum Isopropoxide and Water and Their Reaction Mechanism” by An et al., hereafter An.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

5. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

An discloses an ALD deposition technique for forming Al₂O₃ using DMAI and water sequentially on silicon substrate by repeating the sequence to form a layer of desired thickness (1659-1660, figure 1). An discloses the temperature of the substrate at 150°C (1660) and discloses DMAI, Ar, H₂O, Ar sequence, wherein the pulse length is greater than 0.1 seconds (1660).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3, 5, 6, 7, 10, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Werkhoven.

Werkhoven is applied here for the same reasons as discussed above, and while the examiner maintains the position that Werkhoven anticipates the claim limitations, at the very least the claims are obvious over Werkhoven. Specifically, Werkhoven discloses diethylaluminum ethoxide as an ALD precursor for Al_2O_3 film and therefore the claim would have been obvious because “a person of ordinary skill has good reason to pursue the known options with his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.”

Additionally, it would have been obvious to one of ordinary skill in the art to have selected the appropriate aluminum precursor, including diethylaluminum ethoxide, with a reasonable expectation of successfully and predictably providing an ALD deposited aluminum oxide film. The prior art can be modified or combined to reject claims as prima facie obvious as long as there is a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375.

8. Claims 4, and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Werkhoven as applied in section 3 and 7 above in view of US Patent 5922405 by Kim et al.

Werkhoven is applied here for the reasons above in section 3 and 7, however, the reference fails to explicitly disclose the specific dialkylaluminum alkoxide compounds as claimed. Specifically, Werkhoven discloses diethylaluminum ethoxide (0089). However, Kim discloses known aluminum precursor compounds for the deposition of aluminum oxide film discloses various dialkylaluminum alkoxide precursors of a general formula, which is inclusive of including diethylaluminum ethoxide, dimethylaluminum isopropoxide and dimethylaluminum s-butoxide,

Therefore, taking the references collectively, it would have been obvious to one of ordinary skill in the art to have selected the appropriate aluminum precursor, including dimethylaluminum isopropoxide and dimethylaluminum s-butoxide, with a reasonable expectation of predictable results because Werkhoven discloses utilizing known aluminum precursors in ALD deposition including diethylaluminum ethoxide and Kim discloses known and suitable vapor deposition precursors for aluminum include those claimed. While the examiner notes Kim is directed to CVD precursors, one skilled in the art charged with the knowledge of Werkhoven and Kim would reasonably expect success using the precursors of Kim in the process of Werkhoven because Werkhoven discloses diethylaluminum ethoxide a dialkylaluminum alkoxide within the formula as

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taught by Kim and Werkhoven also discloses alkyl groups in aluminum precursors may include propoxides and s-butoxides.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID TUROCY whose telephone number is (571)272-2940. The examiner can normally be reached on Monday-Friday 8:30-6:00, No 2nd Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David Turocy/
Examiner, Art Unit 1792

/Timothy H Meeks/

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